



AN ESSAY  
ON THE FORGOTTEN ART  
OF THE PUNCHCUTTER





*Correction:* The illustration on the cover looks right but it is technically wrong. Punch characters must be cut in reverse reading position. This requirement is so stated in the essay, if not in the colophon. A correct drawing is here presented as part of this apology.





JOSEPH MOXON'S  
PREFACE TO  
LETTER-CUTTING

*Letter-Cutting is a Handy-Work hitherto kept so conceal'd among the Artificers of it, that I cannot learn any one hath taught it any other; But every one that has used it, Learnt it of his own Genuine Inclination . . . the Rules I follow I shall shew here, and have as good an Opinion of these Rules, as those have that are shyest of discovering theirs. For, indeed, by the appearance of some Work done, a judicious Eye may doubt whether they go by any Rule at all, though Geometrick Rules, in no Practice whatever, ought to be more nicely or exactly observed than in this.*

# THE ESSAY

The necessity for cutting punches by hand ended with the invention of the punch-cutting engraving machine about 1885. This invention made possible the increase and control of punchcutting needed for keyboard typesetting machines, but it also brought doom to the unique design advantages inherent in hand punchcutting. Before the invention of the engraving machine all type design was finalized by the hand of the punchcutter in the medium of soft steel, hardened and driven into copper to produce the matrix needed for typesetting.

For centuries the punchcutter was both designer and craftsman. This was an ideal combination and is evidenced by the fact that all great types of the past were designed and cut by the masters whose names they bear. Examples are the Italian types of Nicolas Jenson and Giambattista Bodoni; the French types of Claude Garamond, Robert Granjon, Pierre Simon Fournier and François-Ambroise Didot; the English types of William Caslon and John Baskerville. There are others.

It is well known that the manuscript book preceded the printed book and that the writing styles of the scribes furnished the models for the design of the early punchcutters' alphabets.



The first types used by Johann Gutenberg were based upon the German angular Gothic manuscript hand of his time. Every effort was made to produce a facsimile of this style, and Gutenberg succeeded remarkably well in all respects. In this instance the punchcutting technique was directed to one objective—the duplication of the whole effect of the manuscript book. Therefore, at this stage the new technique produced no significant visual departure from the pen-written images. By 1470 when Nicolas Jenson printed *De Praeparatione Evangelica* by Eusebius in a new roman type, Jenson's punchcutting technique introduced marked changes in his type images when compared with the humanistic hands of Italy which he used as his model.

The scribes' writing with a broad pen on parchment and the cutting with a graver on steel result in quite different effects. Writing with a pen is the ultimate in flexibility and therefore encourages invention. In fact, the pen and the brush have been the principal tools in the evolution of our alphabet and in the establishing of historic high points in calligraphic styles. Punchcutting, being much less flexible, is less inventive but infinitely more precise in statement. Regardless of some limitations, the punchcutting technique brought about characteristics of its own which definitely separated

type from calligraphy. In addition, the technique met all the precise dimensional requirements inherent in typographical elements.

Although punchcutting was always given top distinction in the typographic procedure and in the beginning was performed by such craftsmen as goldsmiths, it should not be construed that all handcut punches resulted in distinguished types. Concurrently with the masters dating from the middle of the 15th century were cutters of lesser skill and taste who supplied their patrons with no more than adequate versions of the current styles of their time and country. In fact, the vast majority of types from the past can only be identified by the resemblance they have to some contemporary style.

As has been indicated, in the early centuries of printing from movable type all operations in the typographic procedure were carried on under one printing house roof and to a large extent by the hand of one master. As time went on, punchcutting and matrix making separated from printing and finally so did typefounding. By the 19th century the need for punchcutting increased materially with the multiplication of type foundries. The increase, however, was mostly in the direction of duplicating current type styles with a few leaders assuming the responsibility for new design. This kind of trade

growth did not add to the distinction of punchcutting. Decline in the profession came with the revolutionary advent of keyboard machine typesetting and the use of mechanical engraving for meeting the punchcutting needs of these machines. (A blow to the actual necessity for the punch, in the case of foundry type, came when it was discovered the engraving machine could also engrave a matrix.) In our own century there have been a few practicing punchcutters, sometimes connected with foundries, sometimes working independently.

The German foundries have been more faithful to the punchcutting profession. Rudolf Koch cut punches for the Klingspor Foundry on occasion; Stempel has August Rosenberger; and Enschedé has profited from the punchcutting of P. H. Rädisch. During the establishment of the English private presses, before the turn of the century, the hand punchcutter enjoyed a brief revival of a need for his skill. It is fortunate that there have been even a few survivors because the technique of punchcutting by hand is still essential knowledge for the complete education of a designer of typefaces.

Although punchcutting was practiced for fully 400 years as an essential step in typefounding, there has been very little information written on the subject, possibly

because the craft was extremely personal and usually performed by only a few. Every craftsman had his own approach to the work, and attempts at explanations by writers are more theoretical than instructive.

Joseph Moxon, writing in his *Mechanick Exercises* in 1683, devotes a chapter to lettercutting. His preface, printed at the beginning of this essay, prepared his readers for what was to follow. What did follow was an explanation of working procedures, the making of gauges and tools, and the geometry of constructing letters and reproducing them on typographically restricted body areas. His instructions on the correct use and pitfalls of the graver and file are painfully detailed, probably recalling situations of personal experience. When it comes to examples of Moxon's work, his models prove to be completely unworthy of his enthusiasm as a writer on the subject.

Pierre Simon Fournier, called *le jeune*, published a manual on typography in 1764. In his opening chapter he discusses the principles of punchcutting. Here are some excerpts from a translation by Harry Carter published in 1930 by the Soncino Press.

"A man cannot be a good punch-cutter without being a typographer, that is to say he must know every detail of the operations involved in typefoundry and printing,

that he may work with an eye to them. Holding as it were the key to the whole art, the punch-cutter should anticipate every step in the casting and impression of the letters. It is thus that such men as Simon de Colines, Garamond, Granjon, Le Bé and the de Sanlecques, to whom printing is indebted for the whole of its progress, became masters of this art, which they have carried in France to a pitch of perfection to which neighbouring peoples have never attained.

"It is, perhaps, possible to be a good punch-cutter without practising printing, but not without understanding the theory of it. Those who have embarked upon the task of cutting letters without this preliminary knowledge have invariably failed. We have examples not far to seek who gravely dishonour our profession."

Fournier also goes into some considerable detail about the procedures in punch-cutting. He is explicit about the use of the counter punch and indicates that it should be cut to the exact counter shape of the particular letter and that when driven into the face of the punch blank and faced down to eliminate the bulge caused by the driving the remaining counter shape should stand. This is a point of non-agreement with other sources.

The printing historians of our own era have referred to punchcutting with some awe and respect. Theo. L. DeVinne in his *Invention of Printing* states that the cutting of punches demanded a degree of skill in the handling of tools and of experience in the working of metal rarely found in any man who undertook to learn the art of printing. In another instance he claims that "not every goldsmith could do this work with neatness."

While Daniel Berkeley Updike does not discuss punchcutting as a technique in his *Printing Types*, he does speak of the requirements for a successful type which relate to punchcutting. He states, "... a design for a type alphabet that may be entirely successful for the size for which it is drawn cannot be successfully applied to all other sizes of the same series. Each size is a law unto itself and is often bettered by modifications in the original design needed by the feeling and taste of the designer." And again, "I have sometimes questioned whether a machine can be so managed that it will ever produce those fine and almost imperceptible qualities of design given to it by the hand of a clever type-cutter."

In a letter to Mr. Updike, Bruce Rogers, the most celebrated of American book

designers, had this to say: "I have come to believe that perhaps only hand-cut punches, cut by the designer of the type, can preserve the real feeling of the design."

Adèle Millicent Smith in her book *Printing and Writing Materials*, 1904, makes a clear but not entirely accurate statement about the punchcutter's procedure:

"The punch-cutter first draws a geometrical framework, on which is determined the position of each line and the height of each character. The beauty of the printed page consists in the apparent precision of the types. The characters must seem uniform in every particular, but some allowance must be made for optical delusions; occasional deviations must also be made to render each letter pleasing to the eye in any combination with other letters.

"The interior of the letter is not cut out, but the hollow of the letter, or that part of it which does not show black in the printed impression, is formed on steel in high relief. This is the Counterpunch.

"The Punch is made by impressing the counterpunch into the end of a short bar of soft steel. The interior of the letter is thus quickly made at one stroke, with much neater edges than could be given by cutting. The outer edges are cut away, and the

model letter stands in high relief." This is the usual writer's explanation of punchcutting.

In order to be sure about the punchcutting technique, I have discussed the subject with the contemporary master Victor Hammer who has cut punches for several versions of his Uncial type and lately for an unusual cursive version of the Uncial. Mr. Hammer avoids formalizing his procedures into rigid steps as proclaimed in most published statements. He quickly deflates the frightening finalities which one encounters in the explanations and illustrations used to familiarize readers with procedures such as follows:

- 1 Visualization of the letter form on paper or in the mind;
- 2 Plotting the letter elements on the face of the steel blank;
- 3 Cutting the counterpunch to exact shape for each letter needed;
- 4 Hardening the counterpunch and striking it in exact position on the face of the punch blank;
- 5 Finishing the letter by working around the contour shape with files and gravers until the letter has been completely defined in all details; <sup>and lines</sup>
- 6 Proving the letter mechanically by measuring and visually by smoke proofs;



7 Proving the amicable relationship of the letter as a worthy member of its font.

These requirements, it would appear, must be attained as an initial feat with disaster attending every slip. Such is not the case. Slips of the file or graver, misjudgment of form, miscalculation of dimensions—in fact, any change of mind or mishap within reason can be obliterated by refacing the punch (held in a vertical position by the facing block) on an abrasive stone to whatever extent is needed—an operation that has the effect of widening all of the strokes of which the letter is formed and thereby giving the punchcutter a chance to start again on shaping them to fit his ideal. In short, there is always an opportunity to correct a slip or misjudgment.

Each of the *frightening* and *exact* procedures mentioned above only appeared to other writers to have these characteristics because they were not themselves punchcutters and were unfamiliar with the process. It is in fact a mechanically simple process well within the scope of any engraver or other craftsmen. It is not cutting a punch that is so difficult. What is difficult is the attainment of the knowledge, skill, taste and trained eye. But let us now consider each of the procedures mentioned above.

1 Visualization of a letterform is possible in direct proportion to familiarity with that form. Early punchcutters were extremely familiar with their forms because they spent their entire lives working with one style in roman and italic and only occasionally ventured into an unfamiliar style area.

Familiarity comes from practice—by drawing or writing a letter over and over again, varying only the size or width proportions. Consider how many times the early scribe would have written the letter e correctly during his active career. It became second nature for him to write each letter on vellum with rhythmic precision and make the same shape time after time. With this same aptness the punchcutter could see each letter about to be cut in steel clearly in his mind.

2 Plotting or placing the image of a letter on the face of a steel blank can be accomplished in several ways. The image of the letter can be scratched lightly on the steel with a sharp instrument. It also can be accomplished by wax transfer. (To make a wax transfer, the letter is first sketched precisely on thin paper with a lead or graphite pencil. The face of the blank is covered lightly with wax. A finger rubbed on soft wax and then daubed on the face of the steel will suffice. The drawn letter is then turned

face down on the steel, secured firmly, and transferred by rubbing the back of the paper with a smooth metal burnishing tool. The letter will then be transferred exactly.)

A paper drawn letter may also be cemented to the steel face down and a little oil applied to the back which makes the paper so transparent that the image on the other side becomes extremely clear. Instead of oil, it is possible to rub away the fibres of the paper until the other side becomes clear and distinct. If the transfer method is used, the letter will naturally appear in reverse reading position on the blank, which is the correct letter position of a punch. If any other method is used, such as scratching, the letter must be scratched in reverse.

The position of the character should always be centered on the blank regardless of the character's shape. (Position on the body, alignment, etc. are not determined in the punch stage. This determination is made later in the matrix.) It is necessary, however, to place the character on the punch blank so that vertical and horizontal strokes are parallel to the sides of the blank for a roman character, or to maintain a common angle of inclination for corresponding strokes in an italic character. This positioning is helpful when it comes to striking the punch in the matrix.

3 At this point the counterpunch shape can be determined from the image on the blank. (The counter is the negative or sunken portion of the letter, such as are found in B H h n o etc.) On a separate blank the counter shape is transferred in whatever manner pleases the craftsman and then cut, as will be described later.

Miss Smith's statement, quoted above, indicated that the counterpunch was cut the precise shape of the counter and then driven into the blank to provide neater edges than could be given by cutting. This sounds reasonable, but is essentially false.

In the course of cutting a punch, its face will be surfaced several times on an abrasive stone before it is finished. With each surfacing the dimensions of the counter will be changed, and it will be necessary to bring the counter back to its original dimension by cutting back with the graver. I agree with Victor Hammer's procedure in the use of the counterpunch. He sees no need for cutting the counterpunch to exact shape—only approximately. What is essential to him is sufficient counter space and depth in the blank within which to manipulate his gravers. With working space provided it is possible to cut the exact counter shape desired as many times as is necessary and with all the exactness needed.

4 When the counterpunch is finished to the satisfaction of the craftsman, it is heat-hardened and driven into the punch blank in the location of the counter area. The early punchcutter did this striking operation by eye. Later, devices were devised to hold the punch blank in a lower position and the counterpunch above adjusted to correct position. The striking then became greatly simplified and better controlled.

5 When the counterpunch is struck, the face of the punch blank receives a distorted appearance; that is, it is no longer flat. If the distortion is not too great it can be ignored temporarily, but if it is annoying the punch blank can be made flat again by surfacing and replacing the image by duplicating the transfer procedure.

Now comes the serious cutting, the description of which will serve to describe the cutting of the counterpunch also. Starting from a distance about one inch down from the face of the blank, filing begins. The first step is to remove all excess steel from the starting point below the face and tapering to the contour of the letter. A coarse file will be used first for a rough removal of excess steel. A less coarse file will then be used and an approach made nearer the letter contour. Finally, with a very fine jeweler's file a first attempt to coincide with the exact letter contour will be made. At this point the

blank will be placed in the facing block and faced off flat on an abrasive stone.

(The finished punch will later be polished by the same method on a smoother slate stone.)

Up to this point the work has been relatively simple. The finishing stages are more exacting and are accomplished mostly with the graver. (In the finishing stages the file is a treacherous tool; the graver is much safer and capable of great precision and unlimited cutting variations.) The sculptured transition from the simple contour of the punch blank to the intricate contour of the letterform is fascinating to look at, and to a very large extent the beauty of this transitory effect reflects the quality of the letter.

6 At this stage the skill of the punchcutter will come to bear both in the accuracy of the letter in all its dimensions and his design concept of the actual letter expressed in steel.

To find out what has been accomplished, the punchcutter will blacken the face of the character over a flame and carefully press the blackened character onto paper. This is called a smoke proof and, if done properly, it produces an extremely clear impression suitable for critical examination. From such impressions, made many times, minute defects can be detected and corrected in the punch.

7 In all repetitive dimensions, stationary gauges can be used for final checkup. In the variable dimensions, made necessary because of optical illusions, only the eye can judge.

As to the total effect, only the design sense of the punchcutter can be applied. By total effect is meant the complete compatibility of each letter with all others and the correct amount of harmony and contrast necessary for an interesting single line or mass lines of composed printing type.

Hardening the punch, striking the matrix, justifying the matrix, fashioning a mold and casting the type are the principal steps necessary to complete the typefounding cycle. These procedures are also subjects for another essay.

Today's use of the engraving machine and the preliminary steps in the production of punches and matrices are subject matter for still another essay.

## COMMENT

This sketchy account of the hand punchcutting technique was written and produced as a keepsake in connection with a talk on the subject of Punchcutting given before the students and staff members of the School of Library Service of the University of California, Los Angeles, by R. Hunter Middleton on March 31, 1965.

The keepsake was designed by the speaker and set in Ludlow Eusebius and Eusebius Italic, a typeface based on the model of Nicolas Jenson who printed in Venice in 1470. The printing process is letterpress. The cover illustration is a drawing of three Victor Hammer Uncial letters in 48 point size as they would appear in punch form.











